

PETITION

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Your Petitioner, John Williams, a citizen of the United States of America and resident of the State of New York, whose residence and mailing address is 120 Greenridge Avenue, White Plains, New York 10605, prays that Letters Patent Protection be granted to him for a

EMERGENCY BACKUP COMMUNICATIONS SYSTEM

as set forth in the following specification:

Cross-Reference to Related Provisional Patent

This application claims priority based on a provisional patent, specifically on the Provisional Patent Application Serial No. 60/426,758 filed November 15, 2002.

Background of the Invention

1. Technical Field

The present invention is related to emergency communication systems and, more particularly, to a regional emergency backup communications system which includes redundant communication systems connecting a plurality of public safety answering points (PSAP) to at least one centralized operations command center which is designed to withstand both natural and man-made disasters to maintain generally continuous emergency communications regardless of the disaster scenario.

2. Description of the Prior Art

At the present time, the approach to emergency communication across the country is a cobbled-together web of already-available communications networks which offer highly-variable levels of service in an actual emergency. Further, these networks are generally standalone installations that are not interconnected, are not subject to nationally-consistent standard operating procedures and are not required to utilize consistent or compatible technologies. For example, in large cities where the emergency communications network is used frequently, the emergency communications network is modernized and very reliable. On the other hand, in rural areas and smaller towns, the emergency communications network is not as critical to the functionality of the town and therefore may be outdated and unreliable. Given the fact that disasters occur in all areas of the country, this haphazard communication web has the potential to exacerbate any disaster situation as opposed to offering a solution or remedy therefor. In fact, the telephone communication systems currently in place can be woefully inadequate during emergencies and disasters for providing communication between citizens and emergency personnel, as these telephone systems are prone to overload and failure due to line integrity disruptions. It has been found that the telephone communication system is very often one of the first infrastructure systems to be rendered inoperable during a disaster. When such an interruption occurs, it suddenly becomes virtually impossible to receive emergency help calls at the primary PSAP which serves to coordinate the emergency response in

1 the regional area. There is therefore a need for a communication
2 system and backup PSAP which will permit management of the
3 emergency situation regardless of the status of the primary PSAP.

4 The situation that often occurs in connection with emergency
5 scenarios is that the primary PSAP is overloaded with calls from
6 citizens regarding the disaster. With the organization of the
7 phone system comprising a local telephone carrier exchange central
8 office with numerous branches extending outwards therefrom, it is
9 most likely that communication between individuals and the local
10 telephone carrier exchange central office will continue during a
11 disaster while the connection between the local telephone carrier
12 exchange central office and the PSAP becomes overloaded, thus
13 preventing calls from being received at the PSAP. When the phone
14 system overloads, communication between the PSAP and the local
15 telephone carrier exchange central office is disrupted and it has
16 been found that the majority of 911 facilities in the country do
17 not have adequate backup communication systems to overcome such a
18 disruption. In fact, it is not commercially feasible in all but
19 the largest metropolitan areas to include such a backup system and
20 therefore in the majority of situations, when the connection
21 between the local telephone carrier exchange central office and the
22 PSAP fails, no further communications with the citizenry is
23 possible. There is therefore a need for an emergency
24 communications backup system which will permit continued
25 communication with the citizenry during times of emergency.

26 Therefore, an object of the present invention is to provide an
27 improved emergency communications backup system.

1 Another object of the present invention is to provide an
2 emergency communications backup system which includes a generally
3 independent and secure communications system which functions
4 independent of the standard communications web to ensure
5 communications operation post-disaster.

6 Another object of the present invention is to provide an
7 emergency communications backup system which can respond to
8 regional disasters in a coordinating manner over and above the
9 responses of the individual PSAPs.

10 Another object of the present invention is to provide an
11 emergency communications backup system which can be used to
12 supplement the existing emergency response communications web
13 thereby providing needed backup for the system which is not
14 available at present.

15 Another object of the present invention is to provide an
16 emergency communications backup system which will respond to local
17 emergency requests in the same manner as would be performed by the
18 local PSAP to keep the in-place emergency response system as intact
19 as possible during times of extreme duress.

20 Finally, an object of the present invention is to provide an
21 emergency communications backup system which is efficient, safe and
22 durable in use.

Summary of the Invention

The present invention provides, in combination, at least one public safety answering point operative to receive emergency communications from at least one local exchange carrier facility and dispatch emergency response units in response to receipt of the emergency communications and an emergency backup communications system for facilitating emergency responses in the event of loss of communication and/or inoperability of the at least one local public safety answering point. The emergency backup communications system includes a secondary central communications facility in generally independent and generally secure information transmission connection with the local exchange carrier facility. The system further includes an automated location identification interface system operative to receive and facilitate information reception from an automated location identification (ALI) system associated with the local exchange carrier facility and a computer aided dispatch interface system operative to receive and facilitate information reception from a computer aided dispatch (CAD) system associated with the local exchange carrier facility. At least one operator is housed within the secondary central communications facility, the operator being trained to receive incoming emergency communications and screen the incoming emergency communications for location and response information. Finally, a dispatch system housed within the secondary central communications facility is operative to interpret the information received via the automated location identification interface system and the computer aided dispatch interface system and transmit dispatch information

1 including location and situation information to emergency response
2 units for response to incoming emergency communications from the
3 local exchange carrier facility.

4 The emergency backup communications system as thus described
5 clearly offers several advantages over those systems found in the
6 prior art. For example, particularly in light of the 9/11 tragedy
7 and the potential for terrorist attacks at any time and at any
8 place, there is no guarantee that the present 911 system will be
9 able to deal with the aftermath of such an attack, and at the
10 present time there is no backup communication system dedicated to
11 emergency response. Furthermore, because the communications system
12 of the present invention is generally independent and secure as
13 compared to the standard communication network used by the PSAP,
14 the chances are far greater that the communications network of the
15 present invention will survive a catastrophe intact enabling
16 continuous communication between members of the afflicted public
17 and the rescue and emergency workers who are trying to assist them.
18 Also, the emergency backup communications system of the present
19 invention is designed for use with both military and civil
20 communications systems on all levels, including local, state and
21 federal governmental entities which means that the present
22 invention is a macrosystem in that it is designed to coordinate
23 emergency response not only locally, but regionally and nationally
24 if necessary. The present invention thus provides a substantial
25 improvement over those systems found in the prior art.

1 **Brief Description of the Drawings**

2 Figure 1 is a flow diagram showing the general system
3 description of the emergency backup communications system of the
4 present invention;

5 Figure 2 is a flow diagram showing the normal operation of a
6 911 emergency response system during a typical emergency;

7 Figure 3 is a flow diagram illustrating the operation of the
8 emergency backup communications system of the present invention
9 when the primary 911 system is inoperable; and

10 Figure 4 is an illustration of the potential services of the
11 emergency backup communications system of the present invention.

Description of the Preferred Embodiment

The emergency backup communications system of the present invention is shown best in Figures 1 and 3 as providing a "safety net" for 911 systems currently in operation. At the present time, the approach to emergency communication across the country is a cobbled-together web of already-available communications networks which offer highly-variable levels of service in an actual emergency. Further, these networks are generally standalone installations that are not interconnected, are not subject to nationally-consistent standard operating procedures and are not required to utilize consistent or compatible technologies. For example, in large cities where the emergency communications network is used frequently, the emergency communications network is modernized and very reliable. On the other hand, in rural areas and smaller towns, the emergency communications network is not as critical to the functionality of the town and therefore may be outdated and unreliable. Given the fact that disasters occur in all areas of the country, this haphazard communication web has the potential to exacerbate any disaster situation as opposed to offering a solution or remedy therefor. In fact, the telephone communication systems currently in place can be woefully inadequate during emergencies and disasters for providing communication between citizens and emergency personnel, as these telephone systems are prone to overload and failure due to line integrity disruptions. It has been found that the telephone communication system is very often one of the first infrastructure systems to be rendered inoperable during a disaster. When such an interruption

1 occurs, it suddenly becomes virtually impossible to receive
2 emergency help calls at the primary PSAP which serves to coordinate
3 the emergency response in the regional area. There is therefore a
4 need for a communication system and backup PSAP which will permit
5 management of the emergency situation regardless of the status of
6 the primary PSAP.

7 The situation that often occurs in connection with emergency
8 scenarios is that the primary PSAP is overloaded with calls from
9 citizens regarding the disaster. With the organization of the
10 phone system comprising a local telephone carrier exchange central
11 office with numerous branches extending outwards therefrom, it is
12 most likely that communication between individuals and the local
13 telephone carrier exchange central office will continue during a
14 disaster while the connection between the local telephone carrier
15 exchange central office and the PSAP becomes overloaded, thus
16 preventing calls from being received at the PSAP. When the phone
17 system overloads, communication between the PSAP and the local
18 telephone carrier exchange central office is disrupted and it has
19 been found that the majority of 911 facilities in the country do
20 not have adequate backup communication systems to overcome such a
21 disruption. In fact, it is not commercially feasible in all but
22 the largest metropolitan areas to include such a backup system and
23 therefore in the majority of situations, when the connection
24 between the local telephone carrier exchange central office and the
25 PSAP fails, no further communications with the citizenry is
26 possible. There is therefore a need for an emergency
27 communications backup system which will permit continued
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1 communication with the citizenry during times of emergency.

2 The emergency backup communications system of the present
3 invention would include at its core a main national headquarters
4 which is located in a facility with comprehensive military-style
5 protection and security from all forms of disaster and threats
6 including but not limited to physical, electronic, chemical,
7 biological, nuclear and radiological events, thus rendering the
8 main national headquarters generally impervious to all but the most
9 exceptional disaster. Although such a headquarters may be located
10 in any appropriate community, it is preferred that the headquarters
11 be centrally located in the United States in an area of the country
12 which is not earthquake-prone in order to insure the integrity of
13 the headquarters. It has been found that the Omaha, Nebraska
14 metropolitan area offers an exceptionally well-located and well-
15 prepared metropolitan community for such a headquarters, although
16 it is to be expected that numerous regional command centers would
17 be located in metropolitan areas around the country, each of which
18 would be in guaranteed communications via the redundant
19 communication systems with the main headquarters to ensure
20 coordinated response in the event of a disaster regardless of the
21 location around the country. The main headquarters would utilize
22 backbone communications trunks, including landline, fiber optic,
23 microwave, UHF and VHF broadcasting facilities and other radio and
24 satellite technologies to maintain communication between the main
25 headquarters and regional headquarters and local exchange carrier
26 central office facilities. It should be noted that the term
27 "redundant" as used in this disclosure refers to these multiple
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1 backup communication systems, and not in merely a general way to
2 the currently available 911 systems. This broad array of
3 communications infrastructure exists (in many ways, uniquely) in
4 the Omaha, Nebraska metropolitan area. Of course, it is preferred
5 that the regional command centers each be protected in a facility
6 similar to that used in connection with the main national
7 headquarters with comprehensive military-style protection and
8 security from all forms of disaster and threats including but not
9 limited to physical, electronic, chemical, biological, nuclear and
10 radiological events, thus rendering the regional headquarters
11 generally impervious to all but the most exceptional disaster. One
12 way to envision the main and regional headquarters system is to
13 think of it as a "hub and spoke" system, with the main headquarters
14 in communications connection with each of the regional headquarters
15 and each of the regional headquarters in communications connection
16 with the local telephone exchanges and PSAPs, although it should be
17 noted that some direct connections between the main headquarters
18 and local telephone exchanges and PSAPs may be desirable to ensure
19 continuous emergency connections.

20 It is important to note that the emergency backup
21 communications system of the present invention is intended to
22 supplement those 911 systems already in existence around the
23 country but which, for various reasons, cannot be updated or made
24 redundant. The main headquarters will be staffed and operated
25 twenty-four hours a day, seven days a week, in order to be
26 available for any disaster occurrence and in any situation. It is
27 expected that the call center staff will be highly trained and
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1 familiar with the locations to which they are assigned in order to
2 insure proper and quick response to any incoming call. This
3 training is especially critical in connection with the present
4 invention as the emergency backup communications system of the
5 present invention will likely be used only in the event of severe
6 emergency where a disaster has crippled the existing 911 system to
7 such an extent that the emergency backup communications system must
8 be employed. Therefore, the individuals staffing the main
9 headquarters and, for that matter, the regional headquarters, must
10 be highly trained, highly competent, and highly motivated to
11 decisively enact emergency responses in dire circumstances.

12 At the heart of the present inventions are the redundant
13 communication systems, facilities, and technologies which connect
14 the main headquarters and regional headquarters to existing PSAPs
15 and local telephone carrier exchange central offices, thus
16 providing seamless connectivity in the event that one or more
17 primary PSAPs become inoperable or destroyed. The emergency backup
18 communications system of the present invention includes interfaced
19 technologies which permit the main headquarters and the regional
20 headquarters to connect with a variety of local computer-aided
21 dispatch systems (CAD), as well as various technologies to insure
22 compatibility with automated location identification systems (ALI),
23 each of which are currently used by 911 systems in operation at
24 this time. However, it is important to note that as there is not
25 a universal CAD or ALI system used by each and every one of the 911
26 systems currently in operation, an important component of the
27 present invention is the ability to interface with the different

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1 CAD and ALI systems currently being used in the emergency response
2 field to ensure that communication between the local telephone
3 exchanges and PSAPs is maintained.

4 Figure 2 illustrates a typical 911 emergency call handling
5 process. As can be seen, once the citizen places an emergency call
6 from a residence or business or cellular phone, the call is routed
7 through local telephone exchange carrier facilities such as an end
8 office and then into a central office where the call is routed to
9 the PSAP call center. It should be noted that in the vast majority
10 of situations, these emergency calls are routed over standard
11 telephone lines which remain susceptible to disruption due to
12 disaster. Once the PSAP receives the emergency call, the PSAP
13 operators determine the appropriate action and initiate the
14 emergency response by contacting emergency response personnel.
15 This is typically done through the implemented CAD and ALI systems
16 which identify the location of the emergency response unit and
17 dispatch the unit to the emergency call, be it police, fire, or
18 paramedic emergency dispatch. The question is, what occurs when
19 communication between the citizen and PSAP is disrupted? The
20 answer is, absent a redundant backup system as disclosed in the
21 present invention, nothing. No response to an emergency can be
22 dispatched as the local 911 operator is unaware of the occurrence
23 of the emergency.

24 The emergency backup communications system of the present
25 invention is shown in operation in Figure 3. In this scenario, the
26 citizen would place the emergency call which is routed through the
27 local exchange carrier facilities and which is attempted to be
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1 routed to the PSAP call center. The PSAP call center, however, is
2 unable to be contacted due to communications lines being down or
3 the PSAP center being disabled or destroyed. The call is
4 automatically rerouted to the emergency backup communications
5 system of the present invention which would travel either to a
6 local or regional emergency backup communications system
7 headquarters, or directly to the main backup system headquarters
8 via secure and redundant communication systems. Each of the local
9 exchange carriers connected to the emergency backup communications
10 system of the present invention would be connected via redundant
11 communication systems such as landline, fiber optic, microwave, and
12 other radio and satellite technologies, each of which would
13 function in turn to ensure the connection between the local
14 exchange carrier and the emergency backup communications system.
15 As the emergency call is received at the regional or national
16 headquarters of the emergency backup communications system, the
17 emergency operator would screen the call and immediately contact
18 local emergency response teams available in the area of the citizen
19 placing the emergency call and dispatch them via the CAD and ALI
20 systems as previously described. One major difference between the
21 CAD and ALI systems currently being used with 911 systems and the
22 CAD and ALI systems proposed for use with the present invention is
23 that the regional or nationwide nature of the emergency backup
24 communications system of the present invention permits the dispatch
25 of emergency units to the emergency call even if such units are not
26 specifically connected with the primary PSAP which was disconnected
27 or destroyed. Of course, the appropriate local emergency unit
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1 would be dispatched based on availability, but it is an improvement
2 of the present invention over the 911 systems currently found under
3 the prior art that emergency response is not restricted to those
4 units connected with the destroyed primary PSAP. Furthermore, the
5 national and regional headquarters would have multiple CAD
6 interfaces which permit communication with all of the emergency
7 vehicles and teams available for response in the area of the
8 disaster, be it police, fire or paramedic. The emergency backup
9 communications system of the present invention would remain on line
10 until such time as the primary PSAP is restored, at which time
11 control of the emergency situation would be passed back to the
12 primary PSAP and the emergency backup communications system of the
13 present invention would resume its intended backup functionality.

14 An important feature of the present invention is that the
15 emergency backup communications system is designed for use with
16 both military and civil communications systems on all levels,
17 including local, state and federal governmental entities. A major
18 problem with current 911 systems is that they are not designed to
19 communicate with other agencies, and thus emergency response
20 capability is compromised. The critical difference between current
21 911 facilities and the emergency backup communications system of
22 the present invention is that the 911 facilities are microsystems,
23 in that they are only designed and used with specific local
24 emergency response teams, whereas the present invention is a
25 macrosystem in that it is designed to coordinate emergency response
26 not only locally, but regionally and nationally if necessary.
27 Local 911 may be unaware of the various federal agencies available
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1 to them in an emergency, including such agencies as the Center for
2 Disease Control, the Federal Emergency Management Agency, Homeland
3 Security and the various branches of the military, including the
4 National Guard. In fact, the present invention is designed
5 specifically for use in connection with the recently enacted
6 Homeland Defense initiatives which are designed to deal with the
7 results of terrorist attacks, including bioterrorism and other
8 weapons of mass destruction. Current 911 systems are not designed
9 to deal with large-scale disasters, and the likelihood that these
10 systems will overload and fail in such a situation is very high.
11 The emergency backup communications system of the present invention
12 is specifically designed to facilitate such interorganizational
13 cooperation in an emergency situation, and thus presents a
14 substantial improvement over the current 911 systems in use.

15 It is further expected that the emergency backup
16 communications system of the present invention will be used for
17 other applications in which a redundant alternative communication
18 system capable of operating under extreme conditions is necessary.
19 Figure 4 illustrates some of the expected and potential services
20 along with their expected benefits. Several scenarios are
21 envisioned, including the emergency backup communications system of
22 the present invention providing outsource 911 services for
23 communities which, for one reason or another, are unable to design,
24 build, install, or maintain the necessary emergency response
25 systems. The economies of scale often dictate that smaller
26 communities cannot afford stand-alone dedicated PSAP facilities and
27 it is an intended function of the present invention to provide
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1 emergency response facilities for the smaller communities in which
2 incoming 911 calls would be routed to the regional or national
3 headquarters of the emergency backup communications system of the
4 present invention and appropriate emergency responses would be
5 dispatched by the emergency backup communications system operators
6 on the local scale to the person or persons making the 911 call.
7 Alternatively, the emergency backup communications system of the
8 present invention is usable to provide overflow capability to the
9 PSAPs of larger communities or communities that maintain PSAPs for
10 minimal call volumes. The emergency backup communications system
11 of the present invention would be engaged upon reaching the
12 overflow threshold and would be available for increased call volume
13 to ensure that all calls are dealt with speedily and correctly.

14 Another potential use of the present invention is in
15 connection with non-emergency community service communications
16 which many communities would provide but are unable to do so due to
17 the cost of the dedicated information source. Such communications
18 are often referred to as 311/211 calls, which generally deal with
19 health and human services calls. These calls are inquires by
20 citizens related to use of public assistance related to homeless
21 and other shelter facilities, availability of medical services, tax
22 and licensing requirements as well as other such community-related
23 informational communications. With a modicum of training and
24 automated system-generated scripts to standardize call response and
25 increase efficiency, the emergency backup communications system of
26 the present invention can be adapted to provide such services and
27 would serve as a call center and information clearing house for the

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1 community. The 24/7 nature of the emergency backup communications
2 system of the present invention would provide far better service
3 than the currently available 311 and 211 call systems, and would
4 cost communities far less as the overall cost would be divided
5 between multiple communities.

6 Another scenario in which the emergency backup communications
7 system of the present invention will be usable is in connection
8 with pre-recorded outbound calls of public service nature. This
9 scenario would be referred to as a "reverse 911 call" and the
10 emergency backup communications system of the present invention
11 would be used to initiate recorded outbound calls making
12 announcements such as, for example, the availability of new or
13 existing community facilities, e.g. swimming pool seasonal
14 opening/closing, announce voting location hours/procedures as well
15 as notification of potential safety threats including pending
16 storms, toxic spills or virus threats. Again, with only minor
17 modifications, the emergency backup communications system of the
18 present invention is usable in such a situation due to the
19 adaptability and protected communications provided thereby.

20 Finally, the emergency backup communications system of the
21 present invention is usable as a call center to serve the Human
22 Resource needs of government agencies. Initially, large
23 international agencies such as the Department of Defense could
24 provide HR related services to their employees on a 24/7 basis
25 accessible from any location in the world. The emergency backup
26 communications system of the present invention is adaptable to
27 address questions related to paychecks, benefits and employee
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1 assistance programs. The instantaneous response capability of the
2 emergency backup communications system of the present invention
3 permits the user to access information regardless of the time and
4 location of the origination of the call, and thus provides a
5 significant service improvement over those systems found in the
6 prior art.

7 Of course, it is to be understood that numerous modifications,
8 substitutions and additions may be made to the emergency backup
9 communications system described herein. For example, the exact
10 implemented features and functional characteristics of the features
11 described above may be changed or modified so long as the intended
12 functionality of providing a redundant emergency backup
13 communications system is maintained. Additionally, the precise
14 location and characteristics of the headquarters described herein
15 may be changed or modified so long as the functionality of the
16 headquarters, be it local, regional or national, is not impaired.
17 Finally, modification of the communication systems based on
18 improved technology expected and will not affect the functionality
19 of the disclosure contained herein.

20 There has thus been shown and described an emergency backup
21 communications system which fulfills all of its intended purposes.
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